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ABSTRACT

A study investigated the writing strategies used by bilingual and monolingual students. Specifically, the study looked at field dependence vs. independence, possible differences in strategies employed by the two groups when using a word processor, the effects of strategy on the types of revisions made, and the types of revisions and cognitive strategies generating the best written compositions. Subjects were eight fourth-grade mainstream students at similar achievement levels, four of whom were Spanish-English bilingual, and four who used no Spanish at all. Students had access to a word processor in the classroom, were familiar with computers, and had participated in typing instruction. In two sessions, subjects wrote assignments and made revisions. The students answered a questionnaire about the strategies used during the writing process, and the papers were examined for revision types. Finished compositions were externally evaluated. Results did not substantiate tendencies toward field dependence or independence based on bilingualism. When using the computer to compose, bilingual students used stronger (more effective, according to research) skills than did their monolingual counterparts, and used more process strategies. Bilinguals performed more revisions between drafts, usually through insertion or single word changes. Independent analysis favored the compositions of bilinguals by a significant margin. (MSE)

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Efficacy of Word Processing as a Writing Tool for Bilingual Elementary School Students

A Pilot Study

Submitted as a Graduate Research Paper
Presented at the conference of the
Southwestern Educational Research Association

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Efficacy of Word Processing as a Writing Tool for Bilingual Elementary School Students

The purpose of this paper is to examine the strategies used by bilingual and monolingual learners when using word processing as a writing tool. The strategies which they use to execute an assigned writing task should affect both the writing process itself and the outcome, or quality of the final product.

The terms "metacognitive " and "cognitive" are relevant to this study. Selective use of metacognitive or cognitive strategies may affect successful completion of the task. Chamot and O'Malley (1987) define "metacognitive" processes as those which occur on global levels. These processes include the planning and regulation of activities carried out in learning as well as an awareness of what one knows about the material being learned and the process involved in learning it. There is some evidence that students' ability to monitor and diagnose their subject matter understanding is significantly related to achievement (Peterson, 1988). "Cognitive" processes on the other hand are frequently content specific, such as asking for help, or checking answers. Cognitive strategies range from rote recall activities such as memorization to higher level skills such as problem solving and decision making. Here too, Peterson found correlations to student mathematics achievement. Student achievement was positively

related to the total number of cognitive strategies reported in Peterson's study.

Increasingly, documentation is emerging which testifies to the differences in cognitive and metacognitive strategies of learners and the positive results of instruction in these strategies. Benefits of training in metacognitive strategies has been documented with diverse ethnic groups. Metacognitive strategies of Black high school students were examined by Haynes, Comer and Hamilton (1988). While Haynes and his colleagues discovered no significant sex differences for achievement, their results indicated that on the Learning and Study Strategy Inventory (LASSI) low achieving students differed significantly from average and high achieving students in the use of cognitive strategies. Additionally, motivation, the process of "initiating, sustaining and directing activity" (Wittrock, 1986) was determined to be the strongest variable in predicting student achievement in this study.

Strategies used by Hispanic learners acquiring English as a second language (ESL) provide insight to the processes used in language arts areas as well. O'Malley and his colleagues (1988) found that cognitive strategies were used more than metacognitive strategies by beginning and intermediate ESL learners. However, intermediate students did use significantly more metacognitive strategies (in addition to cognitive strategies) than did their less proficient counterparts. Of interest to this research is O'Malley's finding that even more proficient language learners

used such strategies less often when they were executing a more complicated cognitive task involving conceptual integration of new information. One would be led to hypothesize that learners faced with a cognitively demanding task, such as creative writing, might use fewer strategies than students involved in drill and practice tasks. The authors of this particular study have also speculated that there "may be preferences for the selection and use of strategies based on ethnic background" (p.229). This statement rests upon findings that while Hispanic students in the metacognitive treatment group performed better than the control group in vocabulary acquisition tasks, results implied that Asian students did not benefit significantly from instruction in learning strategies. One might speculate then, that Hispanic students who use more metacognitive strategies to perform a complex cognitive task such as writing, will outperform peers who use fewer or more cognitively oriented strategies.

De Avila (1988) however, contends that cognitive style differences of minority students are possibly attributable to poverty and ethnolinguistic group membership. His stance is that linguistic differences have been confused with cognitive differences. DeAvila's research with Duncan, Ulibarri, and Fleming (1979) found that cognitive style differences accounted for less than 10% of the total variance in predicting school performance in a cross-cultural study involving over 1,200 students. He cites as evidence Mestre, Gerace, and Lochhead's (1982) study in which bilinguals were defined as equally balanced

in both English and Spanish, but not as proficient in either as their monolingual counterparts were in English. His position is unclear at times however, because a prior study which he conducted did find that fully bilingual students demonstrated consistent differences from their monolingual counterparts in cognitive style (DeAvila, Duncan, & Ulibarri, 1982).

If however, bilingual learners do display cognitive style differences, then the possibility exists that those differences existed as the learner was acquiring a second language as well. Research in the 1970s which cites possible perceptual differences based upon ethnicity and research of the 1980s speculating as to linguistic interference may really be ignoring a more basic possibility: that learners do utilize differing strategies which are dependent upon the task and the task environment. Coincidentally, those differences may be ethnically related.

Research involving bilingual Hispanic learners has yielded corroborating results. Padron and Waxman's (1986) analysis of reading strategies of bilingual students found that bilinguals used significantly fewer strategies than did monolinguals. Additionally, those strategies that were used correlated negatively with task success: "saying the main idea over and over" and "thinking about something else". These results indicate that cognitive strategies of Hispanic learners during linguistic tasks might be more limited in number than strategies used by their Anglo counterparts.

It is unclear how learning strategies might influence the creative writing endeavors of bilingual learners. Swain (1985) and her colleagues found that except for punctuation tasks, French immersion students did not score significantly different than their monolingual counterparts in other written tasks (time orientation, identification and logic). These students were required to complete compositions involving narrative discourse and two letters using persuasion. Results of these tasks indicate that while monolingual students outperformed bilingual students in oral production, the same effects do not necessarily hold for written production. Swain attributes these differences to opportunities for "output", meaning that immersion students have ample opportunity for written production of L2 in classroom settings, whereas similar opportunities do not exist for oral language production.

Do bilingual Hispanic writers use distinct problem solving strategies which are more or less "expert" than writers from other ethnic backgrounds? Little research is available indicating the extent to which effective writing strategies are used by these students. Padron (1988) documents lack of success in teaching at-risk students to write, noting that poor writers typically have less exposure to writing. Also, she maintains, the narrow scope of instruction may focus more on drill and practice and product than on processes. Pattern practice tends to be the type of instruction ferreted upon bilingual students. Bermudez and Padron (1986) reported no significant differences between the

metacognitive strategies emphasized by teachers of Asian students and teachers of Hispanic students. Students of these teachers generally perceived legibility and teacher expectation as being the strategies of primary importance in writing instruction. Another study conducted by these researchers also indicated more limited perceptions of instructional intent: "Hispanic students in bilingual classrooms perceive being instructed significantly more in revising at the end of the story than students in both traditional classrooms and students receiving ESL instruction" (Padron & Bermudez, in press).

An accepted cognitive process model of writing was developed by Hayes and Flower (1980) to analyze the processes utilized by both expert and novice writers. According to these authors, the writing task includes three components which involve the attention of the writer. The first of these is task environment. Task environment according to Hayes and Flower is everything outside the writers skin, which includes the assignment, the audience and, after the task has begun, even the text itself. The second of these subprocesses is long term memory, which includes knowledge of the topic at hand , knowledge of the audience, and the plans of the author. The last subprocess, and one to which the authors devote the most attention is the writing process itself. That process involves planning, translating, and editing.

One way that the writing process is scrutinized is through analysis of revisions that writers make during writing. In her landmark study on writing processes of twelfth grade students,

Bridwell (1980) examined the revision processes of more and less successful writers. Her study looked at the revisions of 171 twelfth grade English students whose SAT scores were significantly lower than the national average. The assignment was termed "transactional" writing to accommodate a wide variety of purposes: recording facts, changing readers opinions, explaining ideas and informing people. Students were afforded the opportunity of engaging in prewriting, that is, clustering and jotting down ideas to increase their engagement in the study. The written products were assessed in three stages: (1) in-process (the first draft), (2) between drafts (the second day) and, (3) in-process (the second draft). She found that students' second drafts were cosmetically better and mechanically superior to first drafts, and that they were significantly longer. Also documented were the greater number of revisions which occurred in the final state.

The use of word processors to generate creative writing documents has already received some attention by researchers. In 1986 Becker and his associates at Johns Hopkins University began looking at the instructional uses of school computers. The breadth of their research encompasses many aspects of computing during the 1980s in the public schools. Of interest to this study is the fact that for students in elementary grades, the greatest uses of computers in the schools were for the academic areas of math and English. Current research in the effectiveness of computer based instruction should include an in increase in the research base of the use of word processors. Until now however,

scanty evidence exists as to the strategies learners use when word processing (Daiute, 1986: Jackson, 1984).

Research questions include: "Is the paradigm of field field-sensitivity/independence an issue in writing research?". Also, issues of differing strategies for monolinguals and bilinguals must be addressed. Will bilingual students use different strategies than their monolingual counterparts when writing with a word processor? Does use of strategies affect the type of revisions which are utilized? Lastly, which type of revision and cognitive strategies generate the best written compositions with students using word processors?

Method

Subjects

Subjects included eight fourth grade students enrolled in an urban school district located thirty miles from a major southwestern city. The local industry is largely petrochemical and many of the residents of the community are employed by one of several such companies in the area. This study was conducted in a school whose composition is 92% Hispanic, 8% Anglo and 2% Black students. While for most students, English is the instrumental language of the school, that is, the one used to attain the goals of academic success, Spanish is used integratively by many teachers and students in social and disciplinary circumstances. The classroom in which this study was conducted is a mainstream fourth grade class.

Four of the students participating in the pilot study were bilingual/bicultural. These subjects had previously exited a bilingual program in the school one to two years prior to the study. The IDEA test of language proficiency was used to determine current proficiency in English and Spanish. Results indicated approximately equal ability in both English and Spanish for these students. A home language survey was used to verify that Spanish is the language spoken in the home. Students included in this group were those whose parents are first generation immigrants to the United States from Mexico. This group was equally divided as to gender.

The second group of four students included subjects who speak no Spanish, whose parents use no Spanish in the home, and whose parents are at least two generations removed from Mexican residency. These students were also divided equally as to gender. Students in both groups were rated as being approximately equal in achievement as measured by the CTBS test.

Instrumentation

Students in the classroom are provided frequent access to a WICAT system S-300 lab which consists of 30 terminals linked to a 474 megadisk hard drive with 4 meg RAM. The "Typing II" curriculum loaded on the mainframe with cipher tapes was used to familiarize students to the keyboard (which is identical to that of most microcomputer keyboards). "Wordsworth", part of the "Writing II" program, is a word processing program that allows revision, storage and hard copy of documents created at individual

terminals. The program offers two modes of entering text: Insert and Replace. The Insert mode allows students to retain previous text while inserting new thoughts. The Replace mode is faster and allows students to type over old text as new text is added. Other functions inherent to the program are similar to other well known word processing packages (Shift, return, space, delete and tab). Students are able to call up a hard copy printout when they wish to in order to submit their work to the teacher.

Design and Procedure

The writing assignment consisted of a pictorial stimulus around which the students were asked to develop a descriptive paragraph. Effective strategies for creative writing, including webbing and self-questioning were taught prior to the use of word processing for the creative writing activity. According to Bridwell (1980), giving students an opportunity to engage in prewriting preparations seems to increase engagement with the task.

Subjects were selected from one homeroom and had been exposed to the same teaching methods throughout the study. Before analyzing data as to strategies which students use while word processing, it was necessary to review again the tendency for typical classroom behaviors. The teacher was asked, prior to the writing task, to complete Ramirez and Castaneda's (1974) rating forms on observable field-sensitive and field-independent classroom behaviors. The teacher was not informed as to which

students would be participating in the study in an attempt to eliminate the Pygmalian effect.

Three weeks of keyboard activity on the "Typing II" curriculum were implemented prior to the writing assignment to familiarize students with the use of the computer keyboard for typing. The students had at least one year of previous experience in the computer lab using computers for drill and practice activities and were familiar with the functions of many peripheral keys (shift, return, and backspace)

Students were allowed two computer sessions of one hour each to complete the writing assignments. Immediately following the first writing session, students were given printouts of their written documents, and were allowed time to reflect and make pencil corrections. The second day, students returned to the computer lab and executed on computer the revisions that they had made in pencil, as well as any others that occurred to them during the final draft.

Immediately following the completion of the final draft, a questionnaire based upon the Writing Skills Inventory (Padron & Bermudez, 1987) was used to determine students' strategies during the writing process. These strategies were analyzed as to strength (effectiveness as documented by previous research) and frequency of occurrence. Particularly, information as to which group used more and stronger strategies was sought.

Papers were then examined by the researcher as to types of revisions which were made during the between-draft and final-draft

stages of the process. Changes were analyzed according to Bridwell's (1980) classifications of surface, word, phrase, clause, sentence or multi-sentence levels of revisions.

Finally, finished compositions were evaluated by an outside evaluator, expert in the criteria used for judging the written work submitted for the Texas Educational Assessment of Minimum Skills. This work was evaluated using a Likert scale in which ranged from 1 to 4. According to criteria, score 1 papers attempt to address the topic but merely paint a general and vague picture of the object/picture in the reader's mind. Score 2 papers respond to the task in somewhat elaborated descriptions. While score 3 papers represent good attempts at describing the stimulus, the reader has no difficulty in understanding what the writer was attempting to say. Finally, score point 4 papers are described as consistent, organized and elaborated informative descriptions which are unified and easy to read.

Results

Tendencies toward field-sensitivity or field-independence based upon bilingualism were unsubstantiated in this study. Because of the small sample size, parametric statistical methods were not used. Descriptive data analysis indicated that English speaking subjects were significantly more field-sensitive in their personal relationship with their teacher than their bilingual counterparts. Additionally, bilingual students were perceived by their teacher as being more field-independent (Appendix A, Child Rating Forms).

Regardless of whether students displayed anticipated tendencies toward field-sensitivity or field-dependence, the thought processes used by students with differing linguistic backgrounds deserved evaluation (Padron,1987). Results of the Writing Skills Inventory reported that when using the computer to compose, bilingual students utilized stronger skills than did their monolingual counterparts. Bilingual students reported using more process strategies (thinking of the audience, choosing the topic and imitating models of good writing), while monolinguals reported focusing more on product (spelling and neatness) as being important to the writing endeavor. When students were asked to list the strategies they felt to be most important to the writing process, both groups indicated that the use of similes and personification were most important in their writing. Bilingual students, however were able to list more strategies independently than were monolinguals.

When revisions were analyzed, bilinguals were found to perform more revisions than did monolinguals during the between draft stage. Most of these revisions were due to insertion or changes of single words. Final draft analysis results indicated that bilinguals made more revisions than did monolinguals (31 vs. 26) but that all bilingual revisions were the add-on type. That is, their sentences were added to the end of the final draft paper, rather than thoughts inserted into the text of the original (see Table 1).

Table 1

Descriptive Analysis for Between Draft and Final Draft Revisions

	Between Draft Monolingual	Between Draft Bilingual	Final Draft Monolingual		Final Draft Bilingual	
Surface	15	17	0		0	
Word	11	21	5		0	
Phrase	6	5	2		1	
Clause	1	5	1		1	
Sentence	6	4	3		1	
Multiple-Sentence	1	1	I* 6	A** 9	I* 0	A** 28
TOTALS	40	53	26		31	

I*: Inserted sentences
A**: Added sentences

The final analysis of student computer created compositions included judgement of quality of output. Paragraphs were judged blindly by an expert reader. Results favored those compositions created by bilingual students by .75 points on a 4 point scale. No compositions of monolinguals were rated above 2, while bilinguals' scores ranged from 2 to 4.

Educational Implications

While the advantages of using word processing (as opposed to paper and pencil) in the generation of creative writing documents is not addressed by this research, some precepts developed by earlier researchers might bear more investigation. For instance, Ramirez and Castaneda's (1974) thesis that Mexican-American students are more field-sensitive than Anglos is not

supported. While it is beyond the scope of this paper to argue the effects of ethnicity upon writing performance or process strategy, it does appear that students who are perceived by their teacher as being more field-independent demonstrate skills which Ramirez and Castaneda had determined to be field-sensitive. Their studies which indicated field-sensitive individuals as giving longer, more complex stories to picture stimuli was not born out by this study. In this case, the students perceived as being more field-independent (the bilingual students) produced more complex and well-written documents.

The extent to which bilingual students utilized effective cognitive strategies was not consistent with prior research. Because all subjects were approximately equal as to achievement, one would expect no differences in the use of cognitive strategies (Haynes et al.,1988). However, this was not the case. Bilingual students reported using more strategies as well as the use of more effective strategies when writing. However, O'Malley's (O'Malley et al., 1988) findings are not contradicted by this study. He speculates that novice ESL learners used fewer metacognitive strategies than did intermediate learners. The possibility exists that because the subjects of this study had successfully completed the task of learning a second language, they could be thought of as "expert" in their use of metacognitive as well as cognitive strategies.

Revising strategies of the bilingual learners in this study also appear to be slightly different from those of monolinguals.

Monolinguals performed slightly more revisions at the sentence level, a strategy which Bridwell (1980) regards as indicative of less expertise. However, bilinguals did perform more revisions during the between draft stage, indicating more thought and consideration outside the computer lab. During the final draft stage, bilinguals included more add-on sentences, creating longer written compositions. According to Daiute (1983) this strategy is utilized more by novice writers.

Revision strategies notwithstanding, bilingual writers were judged to produce superior documents as compared with monolinguals. The bilingual/bicultural capabilities of these students appear to have positively affected the quality of their written work. And while characteristics commonly associated with field-sensitivity/independence may not play a part, the cognitive strategies of these students during the composition process affected their goals.

The relationship between revision and final product appears uncertain and is unsubstantiated by this study. However, researchers and practitioners would benefit from knowing which type of revisions produce superior written work. And are there differences in the types of revisions which should be taught dependent upon the expertise of the learner ? Are these differences linguistically based? And how does word processing affect these strategies and outcomes during the revision process (Daiute, 1986)?

The revision process appears to be based upon a number of factors which may include bilingualism, method of production (technology) and the cognitive strategies which are employed. According to Bridwell (1980) revisions offer a "window into the cognitive operations which occur when a writer writes" (p. 220). The importance of effective communication through writing is emphasized daily in our lives. That we can assist students to fully utilize their unique capabilities is the challenge posed to educational researchers.

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